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REMARKS

In the Final Office Action, the Examiner noted that claims 1-11 are pending in the application and that claims 1-11 stand rejected. By this response, claims 1 and 7 are amended to more clearly define the Applicant's invention and not in response to prior art. All other claims continue unamended.

In view of the amendments presented above and the following discussion, the Applicant respectfully submits that none of the claims now pending in the application are anticipated under the provision of 35 U.S.C. § 102 or obvious under the provisions of 35 U.S.C. § 103. Furthermore, the Applicant also submits that all of these claims now satisfy the requirements of 35 U.S.C. § 112. Thus, the Applicant believes that all of these claims are now in allowable form.

Rejections

A. 35 U.S.C. § 112

The Examiner rejected claims 1-9 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

Claims 1-9

The Examiner rejected claims 1-9 as being indefinite alleging that it is unclear how each level after the first comprises a common point to extend from and also extend from the extremities of the previous order lower level.

In response the Applicant has amended claims 1 and 7 to more particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Specifically the Applicant has amended claims 1 and 7 to claim that the extremities of a previously lower level act as a common point for a plurality of segments of a subsequent level to extend from. As such, the Applicant submits that the basis for the Examiner's rejection of claims 1-9 has been removed, and respectfully requests that the Examiner's rejection of claims 1-9 be withdrawn.

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Claims 1-9

The Examiner rejected claims 1-9 as being indefinite alleging that it is unclear how what makes up the next order higher level and the previous order lower level.

In response the Applicant has amended claims 1 and 7 to more particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Specifically the Applicant has amended claims 1 and 7 to claim that the extremities of a previously lower level act as a common point for a plurality of segments of a subsequent level to extend from. Claims 1 and 7 further define how each level is comprised of a plurality of segments, each of the segments linearly extending from a common point and having equal lengths, wherein a subsequent order higher level is formed by a plurality of segments, each of the segments having equal lengths and linearly extending from the extremities of a previously order lower level, the extremities of the lower level acting as common points for the segments of the next order higher level to linearly extend from and to form the level. As such, the Applicant submits that the basis for the Examiner's rejection of claims 1-9 has been removed, and respectfully requests that the Examiner's rejection of claims 1-9 be withdrawn.

Having made the changes described above, the Applicant respectfully submits that claims 1-9, as they now stand, are definite and hence fully satisfy the requirements of 35 U.S.C. § 112, second paragraph, and are patentable thereunder.

B. 35 U.S.C. § 102

The Examiner rejected claims 1-2, 4-5, and 10-11 under 35 U.S.C. 102(b) as being anticipated by the Koh et al. patent (United States patent 5,416,861 issued May 16, 1995, hereinafter "Koh"). The rejection is respectfully traversed.

The Examiner alleges that, "Koh et al. disclose a network Fig. 1 for distributing a power signal in an optoelectronic circuit 20 comprising a plurality of

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electrically conductive pathways forming at least one level, wherein the portions of the conductive pathways are interconnected." The Applicant respectfully disagrees.

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim" (*Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1983)) (emphasis added).

The Applicant respectfully submits that Koh does not teach, suggest or disclose each and every element of the Applicant's claimed invention arranged as in the claims. More specifically, Koh discloses an optical waveguide H-tree design for **global clock distribution** on multichip modules (MCM). (See Koh, ABSTRACT). Koh fails, though, to disclose at least the Applicant's invention of claim 1, which specifically recites:

"A network for distributing a power signal in an optoelectronic circuit, said network comprising:

a plurality of electrically conductive pathways forming at least a first level wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths, and wherein the segments of a next order higher level are formed at the extremities of a previous order lower level, the extremities of the previous order lower level functioning as the common point for the formation of the next order higher level;

means for coupling said power signal from a primary input to the common point of the first level; and

terminal nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal." (emphasis added).

There is absolutely no disclosure in Koh for a "network for distributing a power signal in an optoelectronic circuit, said network comprising a plurality of electrically conductive pathways." The "segments 24" cited by the Examiner are

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not "electrically conductive" as claimed. The Koh reference is simply directed to a different problem than the claimed invention, and the problem is solved in a different manner than claimed here. In contrast to the above quoted claim language, Koh discloses an H-tree configuration for clock distribution (i.e., not power distribution) on MCM substrates using optical rather than electrical interconnection. (See Koh, column 10, lines 57-61.) (emphasis added).

Even further, and maybe of more consequence, there is absolutely no teaching, suggestion, or disclosure in Koh for a network for distributing a power signal in an optoelectronic circuit "wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths" as taught by the Applicant's specification and claimed in at least the Applicant's claim 1. More specifically, in support of at least claim 1 the Applicant's in the Specification, specifically recite:

"A new level of the H-tree is formed by coupling the center of the two perpendicular segments of the new level H patterns to the end points of the preceding level H patterns of the H-tree. In this manner a conductive pathway is formed from the primary input to each terminal node, with portions of each conductive pathway interconnected with one or more other conductive pathways. Since the length of each segment is equal for a respective level, the length of the conductive pathway from the primary input to each terminal node is the same.

In operation, the power distribution tree network utilizes the equal lengths of the conductive pathways of the H-tree network to provide greater bias voltage uniformity to the terminal nodes by eliminating small differences in bias voltage to terminal nodes in different locations of the optoelectronic circuit." (See Specification, page 3, lines 11-23).

It is evident from at least the portion of the Applicant's disclosure presented above, that the Applicant's invention is directed, at least in part, to a network for distributing a power signal in an optoelectronic circuit wherein each of the plurality of segments in each level is of equal length such that a bias voltage for devices connected to the extremities of a final level experience the same bias voltage.

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In contrast to the Applicant's invention, there is absolutely no teaching, suggestion or disclosure in Koh for a network for distributing a power signal in an optoelectronic circuit wherein **each** of the plurality of segments in each level is of equal length. The invention of Koh instead is directed to a network for distributing an optical clock signal and not to a network for distributing a power signal in an optoelectronic circuit where **each** of the plurality of segments in each level is of equal length. As such, the Applicant respectfully submits that the Applicant's invention does have a structural difference over the invention of Koh. Specifically, in the invention of the Applicant, a network for distributing a power signal comprises "a plurality of electrically conductive pathways forming at least a first level wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths". Koh does not teach, suggest or disclose that each of a plurality of segments making up each of the levels all have equal lengths.

In the Final Office Action the Examiner further noted that Koh teaches a that electrical H-tree clock distribution is well-known, however, the Applicant respectfully points out to the Examiner that well-known electrical H-tree clock distribution systems do not teach and do not require that **each** of the plurality of segments in each level is of equal length. Furthermore, the Examiner noted in the Final Office Action that both electrical signals and optical signals as taught by Koh are power signals. The Applicant respectfully disagrees. The electrical signals and optical signals taught in Koh are clock signals and Koh emphasizes the importance of distributing the clock signal. Koh does not teach, suggest or disclose the distribution of a power signal in an optoelectronic circuit wherein **each** of the plurality of segments in each level is of equal length such that a bias voltage for devices connected to the extremities of a final level experience the same bias voltage such that the power supplied by terminal nodes to each of a plurality of devices is substantially equal. The power claimed and taught by the Applicant being directed to a biasing voltage. However, there is absolutely no teaching, suggestion or disclosure in Koh for the equal distribution of a bias

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voltage via a plurality of equal length segments. As such, the Applicant respectfully submits that Koh does not teach, suggest or disclose the invention of the Applicant, at least with respect to claim 1.

Therefore, the Applicant submits that claim 1 is not anticipated by the teachings of Koh and, as such, fully satisfies the requirements of 35 U.S.C. § 102 and is patentable thereunder.

Likewise, independent claim 10 recites similar relevant features as those recited in claim 1. As such, the Applicant respectfully submits that claim 10 is also not anticipated by the teachings of Koh and also fully satisfies the requirements of 35 U.S.C. § 102 and is patentable thereunder.

Furthermore, dependent claims 2, 4-5 and 11 depend directly from claims 1 and 10, respectively, and recite additional features therefor. As such and for the exact same reasons set forth above, the Applicant submits that none of these claims is anticipated by the teachings of Koh. Therefore, the Applicant submits that all these dependent claims also fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

C. 35 U.S.C. § 103(a)

The Examiner rejected claims 3 and 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Koh as applied to claims 1-2 above, and further in view of Watanabe et al., (U.S. Patent No. 5,309,001). The rejection is respectfully traversed.

Claim 3 and 6

Claims 3 and 6 depend directly from independent claim 1 and recite limitations thereof. The Examiner applied Koh to claims 3 and 6 as described above for the Examiner's rejection of claims 1 and 2. The Examiner alleges that

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Koh teaches all of the stated limitations except that the pattern of a level is X-shaped. The Applicant respectfully disagrees.

The Examiner correctly concedes that Koh does not teach that the pattern of a level is X-shaped as claimed in claim 3 of the Applicant's invention. However, in addition and as described above, the teachings of Koh do not teach, suggest or describe at least the Applicant's invention at least with regard to claim 1 for "a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths." (emphasis added).

Furthermore, the teachings of Watanabe do not teach, suggest, or describe the invention of the Applicant, at least with regard to claim 1. Watanabe teaches a surface electrode on the surface of an LED, wherein the surface electrode and the semiconductor layer are in electrical contact with each other at ends of the highest-order branches. (See Watanabe, ABSTRACT). In support of its invention Watanabe teaches:

"At the ends of the sixth-order branches 358a and 358b, there are provided contact portions 359a and 359b for making ohmic contact with the underlying semiconductor layer 351. Meanwhile, the rest of the surface electrode 347 other than the contact portions 359a and 359b is in a state in which a Schottky barrier are yielded on the surface of the semiconductor layer 351." (See Watanabe, col. 16, lines 1-7). (emphasis added).

"Further, since the end portions of the sixth-order (highest-order) branches 358a and 358b and the semiconductor layer 351 are put into successful ohmic contact with each other through the contact portions 359a and 359b while the rest other than the end portions and the semiconductor layer 351 are brought into a state in which the current is suppressed from flowing by the Schottky barrier (i.e. a state in which current will not flow unless a certain high level of voltage is applied), the current can be injected only at the end portions of the surface electrode 351. Accordingly, the light easily goes out of the LED, which leads to further improved external quantum efficiency." (See Watanabe, col. 16, lines 38-50).

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The structure of the invention of Watanabe, as taught, includes contact portions in the highest-order branches for making ohmic contact with the underlying semiconductor layer. In contrast, the Applicant's invention is directed at least in part to a power distribution network having very different structural limitations. In support of the present invention, the Applicant discloses:

"Terminal nodes are coupled to the endpoints of the last level of the H-tree. In this manner a conductive pathway is formed from the primary input to each terminal node, with portions of each conductive pathway being shared between two or more terminal nodes." (See Specification, page 7, lines 13-16).

"The first level is coupled to the primary input, at the center of the two horizontal segments of the H pattern. The conductive pathways distribute a power signal to terminal nodes 16 (represented by circles and as further indicated in the upper right hand quadrant for a portion of the terminal nodes of FIG. 3) on VLSI chip 20, wherein the distance from the primary input to each terminal node 16 is equal. In this illustrative example, **each terminal node 16 represents a VCSEL** and its associated driver." (See Specification, page 6, lines 22-29). (emphasis added).

"In operation of the present invention, the effect of voltage drops due to power supply line resistance are reduced when DC power is distributed to the terminal nodes of an optoelectronic circuit, namely the VCSELs in an array of VCSELs of an OE-VLSI chip, with the H-tree power distribution network. Since the lengths of the conductive pathways to each terminal node are equal, there is greater uniformity of the voltage and current provided to each terminal node." (See Specification, page 8, lines 3-8).

It is evident from the Applicant's disclosure, that the Applicant's invention is directed at least in part to a power distribution network for providing uniform power to external devices connected to each terminal node. As such, it is clear that the terminal nodes of the Applicant's invention are not in ohmic contact with an underlying layer. Furthermore, in support of at least claim 1, the Applicant in the Specification specifically recites:

"Each 'H' pattern includes six equal length segments, with two segments in each of two parallel portions and two segments connected

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perpendicular at the midpoints of the parallel portions to form the H pattern." (See Specification, page 7, lines 3-5).

The Applicant further recites:

"Since the length of each segment is equal for a respective level and the total number of segments to each terminal node is also equal, the length of the conductive pathway from the primary input to each terminal node is the same." (See Specification, page 7, lines 16-19).

It is apparent from the sections of the disclosure presented above that the Applicant's invention is directed at least in part to a power distribution network wherein each of the segments comprising each layer are of equal lengths and the total number of segments connecting each terminal node the primary input are equal. As such, the power provided to each of the plurality of terminal nodes at a last level and subsequently to each of a plurality of connected devices is substantially equal.

The invention of Watanabe is incapable of providing uniform power to devices connected to each terminal node because the surface electrode and the semiconductor layer are in electrical contact with each other at ends of the highest-order branches. The Applicant respectfully submits that at least the structural differences between the highest-order branches of the Applicant's invention and the highest-order branches of the invention of Watanabe make the Applicant's invention patentable over the invention of Watanabe. The Applicant further submits that the structural configuration of the Applicant's highest-order branches are not obvious in view of the invention of Watanabe. The Applicant's invention and the invention of Watanabe are directed to two different devices having different structural limitations used for solving different problems. There is absolutely no teaching or suggestion in Watanabe for the Applicant's invention at least with respect to claim 1 and specifically for the structural limitations of the terminal nodes of the Applicant's invention as described above. More specifically, there is absolutely no teaching, suggestion or disclosure in

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Watanabe for "a plurality of electrically conductive pathways forming at least a first level, wherein each level is comprised of a plurality of segments linearly extending from a common point, each of the segments of respective levels having equal lengths" (emphasis added), as taught by the Applicant's specification and claimed in at least the Applicant's claim 1.

Even further, there is absolutely no teaching, suggestion or disclosure in Watanabe for "terminal nodes coupled at the extremities of a last level for supplying said power signal to a plurality of devices that form at least a portion of said optoelectronic circuit, wherein the number of segments connecting said primary input to each of said terminal nodes is equal such that the power supplied by the terminal nodes to each of the plurality of devices is substantially equal" (emphasis added) as taught by the Applicant's specification and claimed in at least the Applicant's claim 1. Therefore, the Applicant respectfully submits that the Applicant's invention and the invention of Watanabe are directed to two different devices having different structural limitations used for solving different problems. There is absolutely no teaching or suggestion in Watanabe for the Applicant's invention at least with respect to claim 1 and specifically for the structural limitations of the Applicant's invention as described above.

As such, the Applicant respectfully submits that Watanabe does not teach or suggest the Applicant's claim 1. Specifically, the Applicant submits that the structural limitations of at least the Applicant's claim 1 are not taught or suggested by Watanabe.

The Applicant further submits that there is no suggestion or motivation to combine the teachings of Koh and the teachings of Watanabe.

For prior art reference to be combined to render obvious a subsequent invention under 35 U.S.C. § 103, there must be something in the prior art as a whole which suggests the desirability, and thus the obviousness, of making the combination. Uniroyal v. Rudkin-Wiley, 5 U.S.P.SQ.2d 1434, 1438 (Fed. Cir. 1988). The teachings of the references can be combined only if there is some suggestion or incentive in the prior art to do so. In re Fine, 5 U.S.P.SQ.2d 1596,

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1599 (Fed. Cir. 1988). Hindsight is strictly forbidden. It is impermissible to use the claims as a framework to pick and choose among individual references to recreate the claimed invention Id. at 1600; W.L. Gore Associates, Inc., v. Garlock, Inc., 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983).

Moreover, the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984);

The Applicant further submits that even if there was a motivation or suggestion to combine the references (which the Applicant believes that there is none), the teachings of Watanabe fail to bridge the substantial gap between the Applicant's invention, and the teachings of Koh.

As such, and at least for the reason that neither Koh or Watanabe alone or in any combination teach suggest, or describe the Applicant's invention with regard to claim 1, the Applicant respectfully submits that dependent claims 3 and 6, which depend directly from independent claim 1, are also not rendered obvious by Koh in view of Watanabe.

Therefore, the Applicant submits that dependent claims 3 and 6 as they now stand, fully satisfies the requirements of 35 U.S.C. § 103 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

Claims 7-9

The Examiner applied Koh and Watanabe to claims 7 and 9 as described above for the Examiner's rejection of claims 1 and 3 above.

Claim 7 is an independent claim that recites similar relevant features as those recited in claim 1. As described above with regard to the Examiner's rejection of claim 1 and claim 3, the teachings of Koh and Watanabe alone or in

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any allowable combination do not teach suggest, or describe the Applicant's invention with regard to claim 1 or claim 3. As such, and at least for the reason that neither Koh or Watanabe alone or in any combination teach suggest, or describe the Applicant's invention with regard to claim 1 and claim 3 for at least the reasons stated above, the Applicant respectfully submits that independent claim 7, which recites similar relevant features as claim 1, and dependent claims 8 and 9, which depend directly from independent claim 7, are also not rendered obvious by Koh in view of Watanabe.

Therefore, the Applicant submits that claim 7 as it now stands, fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

Furthermore, dependent claims 8 and 9 depend directly from claim 7 and recite additional features therefor. As such and for at least the reasons set forth herein, the Applicant submits that none of these claims are obvious with respect to the teachings of Koh and Watanabe, alone or in any allowable combination. Therefore the Applicant submits that all these dependent claims also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

Conclusion

Thus the Applicant submits that none of the claims, presently in the application, are anticipated under the provisions of 35 U.S.C. § 102 or obvious under the provisions of 35 U.S.C. § 103. Furthermore, the Applicant also submits that all of these claims now fully satisfy the requirements of 35 U.S.C. § 112. Consequently, the Applicant believes that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Jorge Tony Villabon, Esq. at (732)

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530-9404 x 1131 or Eamon J. Wall, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,



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